

F A C T S H E E T



United States
Department of Energy
Grand Junction, Colorado

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Monticello Mill Tailings Site, Operable Unit III Surface and Ground Water Remedial Investigation Addendum/Focused Feasibility Study

In November 2003, the U.S. Department of Energy issued the Remedial Investigation Addendum/Focused Feasibility Study for the Monticello Mill Tailings Site, Operable Unit III, Surface and Ground Water. This fact sheet provides a summary of the information presented in the Remedial Investigation Addendum/Focused Feasibility Study; the complete document is available for review in the public reading rooms in Grand Junction, Colorado, and Monticello, Utah (see "For Additional Information" on last page).

Background

The Monticello Mill Tailings Site is a former ore-buying station and vanadium and uranium mill that operated from about 1942 through 1959 (see Figure 1). The former millsite and nearby properties are being cleaned up as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The Monticello Mill Tailings Site was placed on the U.S. Environmental Protection Agency National Priorities List in 1989. Because of the complexity of the Monticello Mill Tailings Site, the U.S. Department of Energy (DOE) divided the work into three manageable components called "operable units."

From 1997 through 1999, approximately 2.5 million cubic yards of contaminated soil and debris from the millsite (Operable Unit I), peripheral properties (Operable Unit II), and vicinity properties were excavated and placed in an on-site repository for permanent storage. The 1990 Record of Decision for Operable Units I and II required preparation of a Record of Decision for Operable Unit III when sufficient data were gathered to make a remedial action decision through a focused Remedial Investigation/Feasibility Study. The boundary of Operable Unit III is shown on Figure 2 on page 3. Available site data were used in 1998 to prepare the Operable Unit III Remedial

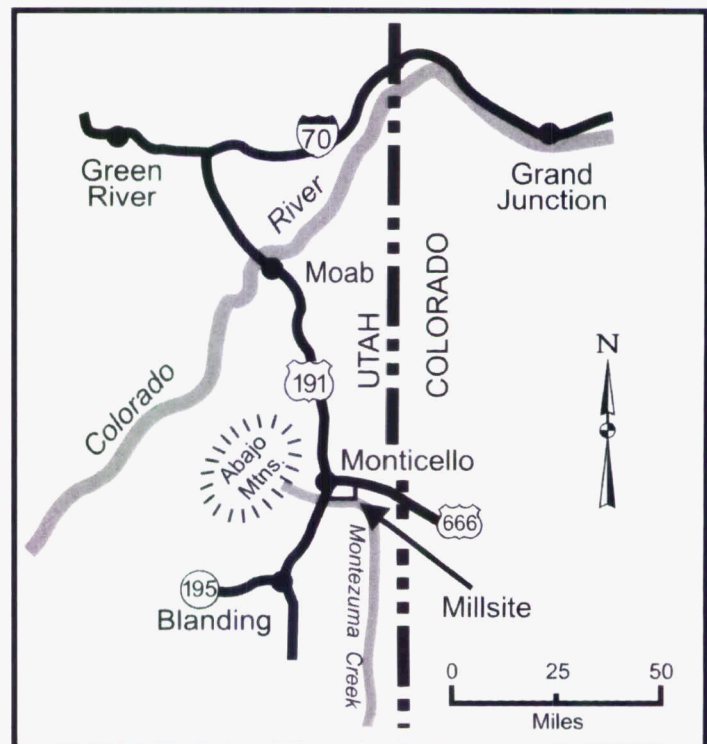


Figure 1. Monticello Millsite Location

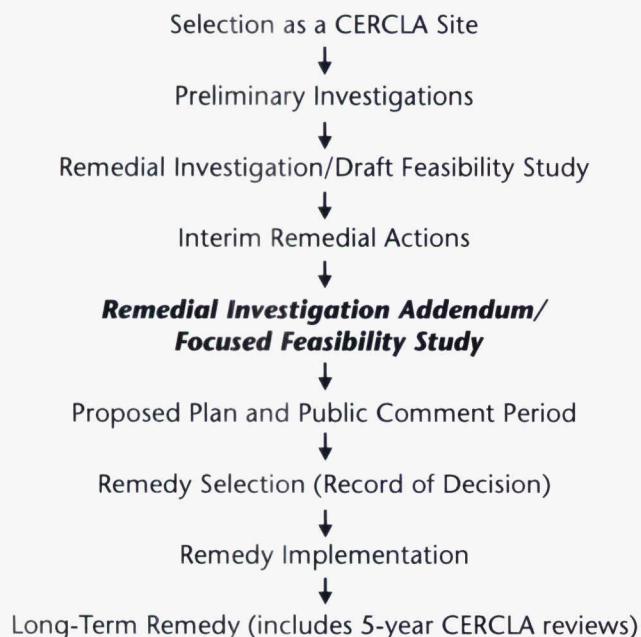
Investigation (final) and Feasibility Study (draft) reports. No decision was made with regard to a final decision for Operable Unit III; instead, after a public meeting and comment period, the decision was made to perform an Interim Remedial Action.

From 1997 to 1999, in addition to cleanup of the millsite and peripheral properties, several other activities were conducted to reduce impacts of the contaminants associated with this site. Some of these activities were part of the Interim Remedial Action that was signed in September 1998. Interim Remedial Action activities included millsite dewatering and treatment, initiation of a ground water management policy to prevent use

What Is a Remedial Investigation/ Feasibility Study?

The Remedial Investigation report presents the effort to identify and document the types, amounts, and locations of contamination at a site. The Feasibility Study report identifies, screens, and compares alternatives that can be used for site cleanup.

CERCLA Process for Operable Unit III



of the contaminated alluvial aquifer, installation of an innovative ground water treatment system (a permeable reactive barrier), and continued monitoring and data collection. Other activities performed during this time period included remediation of contaminated soil and sediment along Montezuma Creek, implementation of institutional controls (controls placed on properties to restrict use), and removal of additional contamination on the millsite that could affect ground water quality. The cleanup of the millsite (Operable Unit I) also affected risks and site conditions associated with Operable Unit III. Because of these changed conditions, it was necessary to update the Remedial Investigation and to finalize the Feasibility Study for Operable Unit III.

The November 2003 *Remedial Investigation Addendum/Focused Feasibility Study* report updates the 1998 final Remedial Investigation report. The updated document includes new information obtained following completion of the soil and sediment remedial actions for the other operable units of the Monticello Mill Tailings Site and completion of the Interim Remedial Action (installation of a permeable reactive barrier) for Operable Unit III. The main objectives of the report are to

- Document the risk assessments using current concentration data, site conditions, and toxicity information.
- Document the ground water model that was updated using current site conditions.
- Complete a feasibility study focused on remedies for the Operable Unit III contaminated surface water and ground water.

Extent of Contamination

Contaminants of concern for Operable Unit III (surface and ground water) are arsenic, gross alpha, gross beta, manganese, molybdenum, nitrate, selenium, uranium (and uranium isotopes), and vanadium. The lower ground water system (the Burro Canyon aquifer) has not been affected by millsite contaminants; contaminants in the upper ground water system (alluvial aquifer) have migrated off the site at concentrations that exceed preliminary remediation (cleanup) goals; concentrations of uranium are of most concern. The extent of the uranium plume is shown on Figure 2 on page 3. In the surface water, nitrate and selenium are the only contaminants of concern that have concentrations exceeding Utah surface water standards. Except for selenium, contaminant concentrations in samples from Montezuma Creek have either decreased or remained stable since 1998. Increasing selenium concentrations have been observed since remediation of the millsite.

Risk Assessment

The November 2003 Remedial Investigation Addendum presents an updated risk assessment for risks to human and ecological receptors that may come in contact with the contaminants associated with Operable Unit III. Both the human health and ecological risk assessments were updated using current concentration and toxicity data.

For the human health risk assessment, the assumptions on how people may come in contact with the contaminants at Operable Unit III are the same as those in the 1998 report. It is assumed that agricultural (landowners) and recreational users and future residents may be exposed to contaminants in soil, sediments, ground water, or surface water. For the more likely agricultural and recreational users, risks are generally below any established benchmarks (risk-based standards under CERCLA).

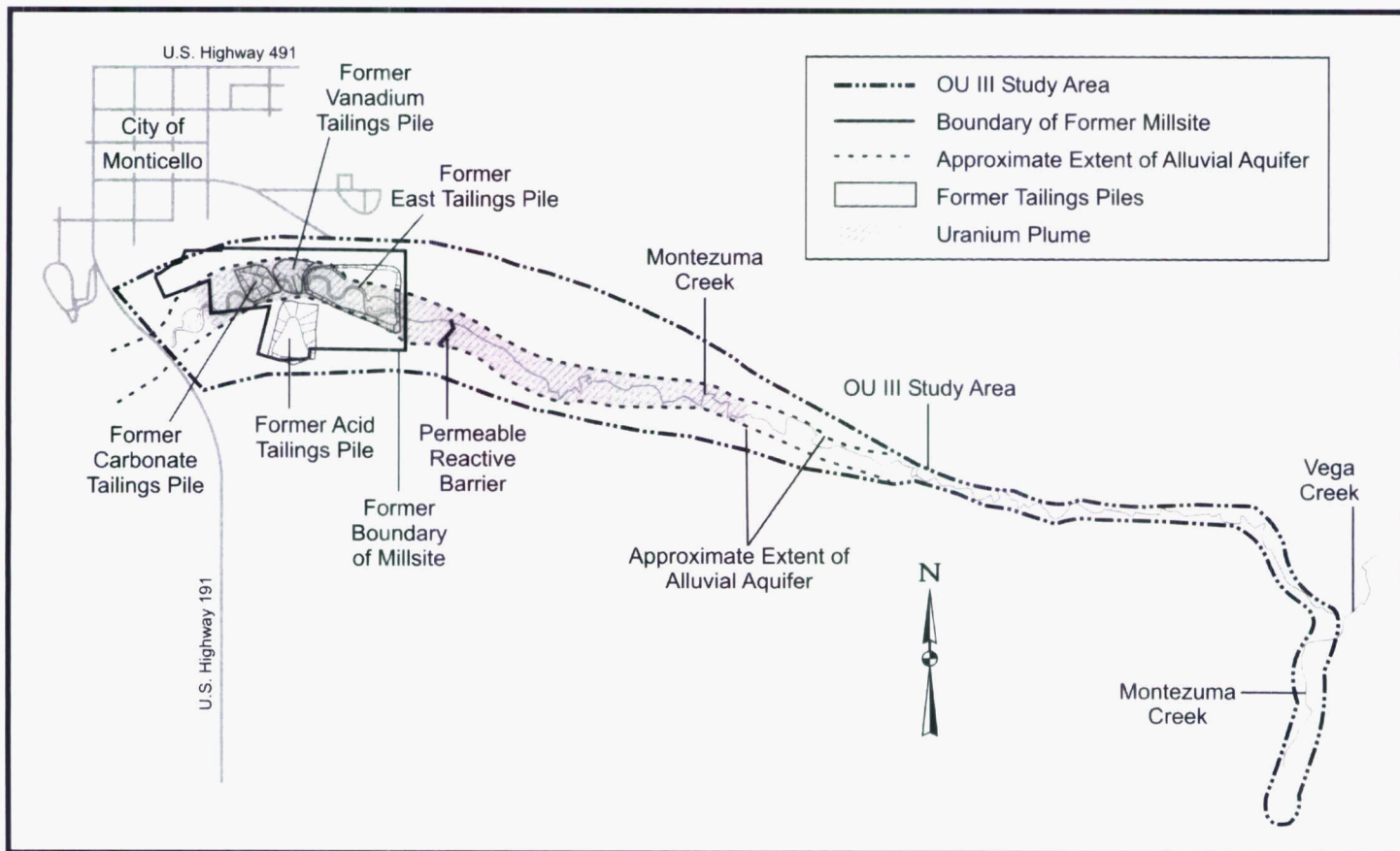


Figure 2. Pre-Remediation Locations of Tailings Piles and Current Uranium Plume at Monticello Mill Tailings Site

A more unlikely residential scenario might occur if the ground water management policy that prevents use of the contaminated alluvial aquifer as the primary drinking water source fails. Under this less likely scenario, risks for contaminants that cause cancer are within the risk range of 10^{-4} to 10^{-6} . Within this range, remedial project managers may make the management decision that risks are considered acceptable based on site-specific information.

The hazard indices exceed 1.0 for arsenic, uranium, and vanadium (compounds that also can have negative effects other than cancer), indicating that the near-term risks would be unacceptable if individuals were to use the contaminated alluvial aquifer as their primary drinking water source.

The updated ecological risk assessment focused on the spotted bat and the southwestern willow flycatcher, which are state and federal endangered species, respectively. The updated ecological risk assessment concluded that, except for selenium, risk to the environment from the Operable Unit III contaminants of concern is not significant enough to warrant the development of remedial alternatives to mitigate that

risk. The impact of selenium concentrations on potential receptors that may frequent newly constructed wetlands is not known. Because of this uncertainty, some future actions may be necessary to protect ecological receptors. A post-remedial action monitoring plan will be developed, and the selenium contamination will be addressed as part of the next CERCLA 5-year review.

Ground Water Model

A ground water flow-and-contaminant transport model was developed for the alluvial aquifer within Operable Unit III to provide a better characterization and to predict future movements of contaminated ground water. The model was used to predict future concentrations of uranium in ground water for a simulated period of 50 years beginning in October 2002. A 50-year time period was set by the U.S. Environmental Protection Agency and the Utah Department of Environmental Quality for cleanup of the contaminated alluvial aquifer. The model is an important tool for evaluating alternatives in the Focused Feasibility Study.

Focused Feasibility Study

The Focused Feasibility Study identifies and presents evaluations of remedial alternatives for contaminated ground water associated with Operable Unit III. Separate remedial alternatives for Operable Unit III contaminated surface water are not developed because ground water discharges to surface water at Operable Unit III and remediation of ground water will also restore surface water quality. Remedial actions (cleanup) for the other contaminated media at the Monticello Mill Tailings Site (soil and sediment) were completed in August 1999.

The following remedial action objectives were developed for Operable Unit III ground water and surface water:

- Prevent ingestion of alluvial ground water that contains contaminants of concern that may pose an unacceptable risk for cancer or that has concentrations exceeding federal or state ground water standards until standards are met.
- Prevent ingestion of alluvial ground water which contains contaminants of concern that may cause unacceptable negative health effects other than cancer or that has concentrations exceeding federal or state ground water standards until standards are met.
- Achieve compliance with state surface water standards for contaminants of concern in Montezuma Creek.

The remedial alternatives that were evaluated in detail for Operable Unit III are

- Alternative 1: No Further Action With Institutional Controls
- Alternative 2: Monitored Natural Attenuation With Institutional Controls
- Alternative 3: Permeable Reactive Barrier With Institutional Controls and Monitored Natural Attenuation
- Alternative 4 (Option 1): Enhanced Permeable Reactive Barrier With Institutional Controls and Monitored Natural Attenuation (pump-and-treat enhancement)
- Alternative 4 (Option 2): Enhanced Permeable Reactive Barrier With Institutional Controls and Monitored Natural Attenuation (in situ enhancement)

Schedule

Remedial Investigation Addendum/Focused Feasibility Study	November 2003
Proposed Plan	November 2003
Public Comment Period	December 1, 2003, to January 15, 2004

Public Meeting

**December 9, 2003
7:00–9:00 p.m.
San Juan Courthouse
Monticello, Utah**

Comments on Proposed Plan Due	January 15, 2004
Record of Decision	April 2004

CERCLA requires that alternatives be evaluated using nine criteria. These criteria include protection of human health and the environment, compliance with existing laws and regulations, effectiveness of the alternative, ease of implementing the alternative, cost, and state and community acceptance. Final state acceptance and community acceptance will be evaluated during and after the formal comment period (see box above). Table 1 is a summary of the evaluation of the remediation alternatives using the CERCLA criteria.

Next Steps

DOE has prepared a Proposed Plan describing the preferred remedy for surface water and ground water. **DOE will present the preferred remedy to the public on December 9, 2003, at the San Juan County Courthouse in Monticello, Utah.** DOE will consider all public comments received during the public meeting and the public comment period (December 1, 2003, to January 15, 2004) before selecting a final cleanup remedy for Operable Unit III. All comments will be part of the responsiveness summary in the Record of Decision, which is the document that will outline the Operable Unit III cleanup plan. DOE, the U.S. Environmental Protection Agency, and the Utah Department of Environmental Quality will cooperatively make the final decision for Operable Unit III. It is anticipated that the Record of Decision will be signed by April 1, 2004.

Table 1. Summary Evaluation of the Operable Unit III Alternatives

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4 Options 1 and 2
Overall protection of human health and the environment	●	●	●	●
Compliance with applicable or relevant and appropriate requirements (ARARs)	◇	●	●	●
Long-term effectiveness and permanence	●	●	●	●
Reduction of toxicity, mobility, and volume through treatment ^a	○	●	●	●
Short-term effectiveness ^b	●	●	●	●
Implementability	○	●	●	○
Cost: net present value	\$526,000	\$1,474,000	\$1,460,000	\$1,513,000 (Option 1) \$1,536,000 (Option 2)
State acceptance	The Utah Department of Environmental Quality currently accepts Alternative 2, but final acceptance is contingent on public comment.			
Community acceptance	Community acceptance of the preferred alternative will be evaluated after the public comment period.			
Notes	ARAR waivers would be required for compliance	Does not require specific performance of the permeable reactive barrier	Requires specific performance of the permeable reactive barrier	Requires landowner approval and effective performance of the permeable reactive barrier

^aAlternative 4 is incrementally better than Alternative 3 which is incrementally better than Alternative 2 because there is a reduction in toxicity, mobility, and volume as more ground water is treated by the permeable reactive barrier.

^bIf the institutional control preventing use of the contaminated alluvial aquifer as a primary drinking water source fails, then Alternative 4 will have the greatest short-term effectiveness because it has the shortest time frame to meet remedial action objectives.

● = Fully meets criterion ○ = Partially meets criterion ◇ = Does not meet criterion

For Additional Information

If you would like additional information on Operable Unit III of the Monticello Mill Tailings Site, the Remedial Investigation Addendum/Focused Feasibility Study and other site-related documents are available for review at the following locations:

Monticello Repository Office
7031 South Highway 191
Monticello, UT 84535
Telephone: (435) 587-2098

U.S. Department of Energy
Public Reading Room
2597 B¾ Road
Grand Junction, CO 81503
Telephone: (970) 248-6089

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